

EOC Warm Up Set

Set 1: Systems of Equations

1. The solution to the system $\begin{cases} 4x + 2y = -12 \\ -8x - 5y = 24 \end{cases}$ is
 - A) (4, 0)
 - B) (3, 0)
 - C) (4, 1)
 - D) (-3, 0)

2. Solve the system. Choose all that apply.
$$x^2 + y^2 + 32x + 2y + 157 = 0$$
$$-x + y - 1 = 0$$
 - A) (-10, -9)
 - B) (-8, -7)
 - C) (9, 10)
 - D) (10, -9)

3. T-shirts cost \$5 to make after a \$150 start up cost. You will sell the t-shirts for \$15 each at a craft fair after renting a booth for \$75 at the fair.
 - a. Write an equation for the cost of the t-shirts.

 - b. Write an equation for the money made for selling t-shirts.

 - c. How many t-shirts will you need to sell to break even? Justify your answer.

Set 2: Quadratic Equations

1. Solve the equation: $4x^2 + 7x - 20 = 0$

A) $\{7, -3\}$

B) $\{3, -7\}$

C) $\left\{ \frac{-7 + 3\sqrt{41}}{8}, \frac{-7 - 3\sqrt{41}}{8} \right\}$

D) $\{2 + i\sqrt{17}, 2 - i\sqrt{17}\}$

2. Choose the correct representations for the quadratic equation $y = x^2 - 4x + 3$.
Check all that apply.

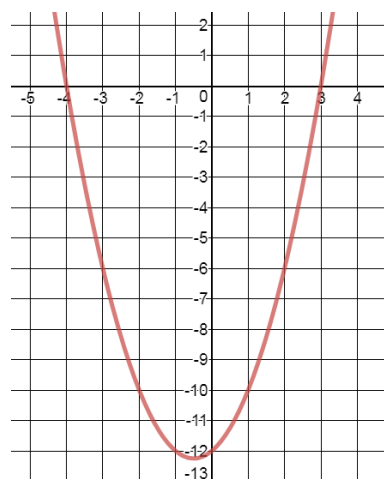
A) $y = (x + 2)^2 + 3$

D)

B)

x	y
-3	24
-1	8
0	3
2	-1
4	3

C) The graph of $y = x^2$ shifted 2 units to the right and one unit down.



3. Object A follows the path given by $y = -16x^2 + 64x + 80$. Object B follows a path given by $y = -8x^2 + 32x + 96$.

a. Which object will fly the highest? Justify your answer.

b. Which object will fly the longest? Justify your answer.

Set 3: Complex Numbers

1. Find the solutions to $(p - 6)^2 + 46 = 0$

- A) $\{6 + i\sqrt{46}, 6 - i\sqrt{46}\}$
- B) $\{-8 + 2i\sqrt{3}, -8 - 2i\sqrt{3}\}$
- C) $\{-2 + 2i\sqrt{2}, -2 - 2i\sqrt{2}\}$
- D) $\{2, -6\}$

2. Which of the following expressions are equal to $4 - 2i$? Check all that apply.

- A) $4(1 - i)$
- B) $(3 + i)(1 - i)$
- C) $(6 + 4i) - (2 + 6i)$
- D) $\frac{2+i}{2-i}$

3. (Source: Illustrative Mathematics)

a. For each integer k from 0 to 8, write i^k in the form $a + bi$.

b. Describe the pattern you observe, and algebraically prove your observation. In particular, simplify i^{195} .

c. Write each of the following expression in the form $a + bi$:

- $i^2 + i + 1$
- $i^3 + i^2 + i + 1$
- $i^4 + i^3 + i^2 + i + 1$
- $i^5 + i^4 + i^3 + i^2 + i + 1$
- $i^6 + i^5 + i^4 + i^3 + i^2 + i + 1$
- $i^7 + i^6 + i^5 + i^4 + i^3 + i^2 + i + 1$
- $i^8 + i^7 + i^6 + i^5 + i^4 + i^3 + i^2 + i + 1$

d. Describe the pattern you observe, and algebraically prove your observation. In particular, compute

$$i^{195} + i^{194} + \dots + i^2 + i + 1.$$